

Application No. 10/624,553  
Reply to Office Action of April 9, 2003

IN THE CLAIMS

Please amend the claims as follows:

Claim 1 (Currently amended): A method, comprising:

culturing a microorganism in a medium to produce and accumulate a target substance  
in the medium; and

collecting the target substance,

wherein

the microorganism is constructed from a parent strain of the microorganism having a  
respiratory chain pathway of high energy efficiency and a respiratory chain pathway of low  
energy efficiency as respiratory chain pathways, and

the microorganism is a mutant strain or a genetic recombinant strain having either one  
or both of the following characteristics:

(A) the respiratory chain pathway of high energy efficiency is enhanced,

(B) the respiratory chain pathway of low energy efficiency is deficient, wherein the  
target substance is selected from the group consisting of an L-amino acid and a nucleic acid.

Claim 2 (Previously presented): The method according to claim 1, wherein the  
respiratory chain pathway of high energy efficiency is enhanced by:

increasing a copy number of a gene coding for an enzyme involved in the respiratory  
chain; or

modification of an expression regulatory sequence of the gene.

Claim 3 (Previously presented): The method according to Claim 1, wherein the  
respiratory chain pathway of low energy efficiency is made deficient by disruption of a gene  
coding for an enzyme involved in the respiratory chain.

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Claim 4 (Previously presented): The method according to Claim 1, wherein an enzyme of the respiratory chain of high energy efficiency is at least one member selected from the group consisting of SoxM type oxidase, bcl complex, and NDH-1.

Claim 5 (Previously presented): The method according to Claim 1, wherein an enzyme of the respiratory chain of low energy efficiency is at least one member selected from the group consisting of cytochrome bd type oxidase and NDH-II.

Claim 6 (Previously presented): The method according to Claim 1, wherein the microorganism comprises enhanced SoxM type oxidase activity and deficient NDH-II activity.

Claim 7 (Previously presented): The according to Claim 1, wherein an enzyme of the respiratory chain pathway of high energy efficiency is cytochrome bo type oxidase.

Claim 8 (Previously presented): The method according to Claim 1, wherein the microorganism is at least one member selected from the group consisting of bacterium belonging to the genus *Escherichia* and *Coryneform* bacterium.

Claim 9 (Canceled).

Claim 10 (New): The method according to Claim 1, wherein the microorganism is at least one bacterium belonging to the genus *Escherichia*.